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(54) Digital coupons for pay television

(57) Digital coupons are selectively transmitted in a communication network to subscriber terminals for promotional purposes. Subscribers automatically receive coupon credits when they meet the preconditions of the digital coupons. Free or reduced price pay-per-view (PPV) programming in particular may be provided when a subscriber purchases a given number of PPV programs at a regular price. The terminals maintain a running balance of available coupon credits and inform the subscriber via a user interface of the available balance. Subscribers can be rewarded for viewing commercial messages by awarding coupons which can be immediately redeemed for PPV programs. With an optional report back capability, terminal usage pattern data can be retrieved and analyzed by program service providers to determine the effectiveness of the promotions and to gather additional demographic and individual data. The integrity of the scheme is assured with encryption techniques.

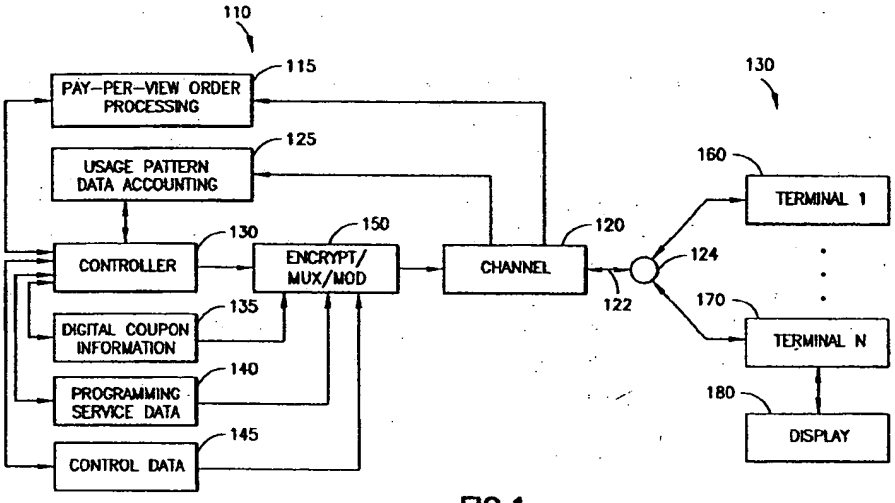

FIG.1

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using paper coupons. The system should allow subscribers to receive an immediate credit when a predetermined viewing pattern has been met. The system should reward subscriber loyalty and encourage subscribers to purchase additional programming services such as PPV programs and/or additional levels of service, such as premium programming services.

The system should also organize the credits in a way to allow the subscriber to take a quick inventory, and should inform the subscriber when a service is available through the promotion. The system should allow flexibility as to how the credits may be used, for example, in regard to the variety of shows, times, and dates the programming may be accessed.

Furthermore, it would be desirable to provide a system for monitoring the success of such promotions, gain feedback on subscriber viewing habits, and determine the viewership (e.g., audience size) of particular programs. The system should employ cryptographic techniques to thwart unauthorized persons (e.g., pirates) who attempt to tamper with the system for illicit gain.

The present invention provides a system having the above and other advantages.

SUMMARY OF THE INVENTION

In accordance with the present invention, an apparatus and method are presented for allowing users of services such as pay television to obtain credits when viewing particular programs. The invention enables program service providers to transmit credit information in the form of "digital coupons" to individual subscriber terminals to promote particular programs and reward viewer loyalty.

A communication system in accordance with the present invention includes a controller for transmitting program services to a plurality of subscriber terminals via a communication channel. The program service may include television programs which are broadcast or continuously transmitted on a predetermined schedule, pay-per-view programs which require specific user selection and either a local transacted or remotely transacted purchase, Near Video-On-Demand which is pay-per-view offered at staggered broadcast times, and Video-On-Demand services, which are transmitted only in response to a user request, or other electronic information such as computer software.

The communication channel may include a cable plant and/or satellite link, for example. The program services can be selectively recovered by the subscriber terminals. For example, a subscriber may select a particular program to view by tuning in the corresponding channel using an on-screen interface, e.g. Electronic Program Guide (EPG), and a remote control unit, or by transmitting a buy order for either PPV or Video-On-Demand programming.

The controller can deliver digital coupon information to the terminals along with program service data using any available technique, such as frequency or time multiplexing. The digital coupon information allows the terminals to obtain credits when recovering particular programs as defined by preconditions of the digital coupon information. For example, the subscriber may receive a credit for one free PPV program when the precondition of purchasing five PPV programs at regular prices has been met. The terminal automatically tracks the balance of coupon credits as coupons are awarded and redeemed. The credits are usable in obtaining program services at a reduced charge (e.g., at a discount or free).

Each terminal includes a processor which monitors a usage pattern (e.g., viewing history) of the terminal to determine if the preconditions of the digital coupon information have been satisfied. For example, the usage pattern may indicate which programs have been recovered by the terminal within the last month, or some other period, or the length of time that a particular program, or program service (e.g., channel) was viewed. The terminal may simply grant coupons based on the purchase of a PPV program, or based on the amount of time spent viewing an infomercial. The credits are thus awarded when there is a correlation between the usage pattern and the preconditions of the digital coupon information.

A user interface such as a graphical user interface (e.g., on-screen display) may be provided to allow the subscriber to selectively redeem the credits. For example, the user may have a variety of options from which to choose, where a cash balance and/or a coupon balance are redeemed in full or in part. The user interface can also be used to obtain a confirmation of user involvement. For example, to verify that the subscriber is still viewing a program, he may be periodically required to provide some sort of control input as the program is displayed.

When the program services include individual programs which can be individually recovered by the terminals, such as with a PPV scheme, the coupon credits are awarded when the usage pattern indicates that a terminal has recovered a particular number of such individual programs, or a particular amount of charges. This allows a coupon credit to be awarded whenever a PPV program has been accessed. One or more coupons may need to be redeemed in order to access a program.

To allow program service providers and advertisers to obtain and analyze the terminal usage data, a usage pattern accounting center which is associated with a network controller may be provided. The usage pattern accounting center can receive usage pattern data from the terminals via a communication link, such as an upstream path in the channel over which the program services are transmitted, or a telephone network. This is especially useful for determining the

the program services.

The digital coupon information provides credits which the terminals can use for a number of purposes. For example, the digital coupon information may provide a discount when the terminals order one or more PPV programs through the PPV order processing function 115. As an example, if a terminal orders five PPV programs within the current billing cycle, the digital coupon credit may allow the terminal to order a sixth PPV program at no charge. Or, for terminals that order PPV programs infrequently, the digital coupon credit may allow the terminal to order a first PPV program at half-price. The digital coupon may be generated automatically based on program coupon criteria established by the service provider. This has the advantage of requiring no direct involvement by the service provider. This is also suitable for broadcast environments where the return path either does not exist, is slow, or not set-up for interactive transactions.

Alternatively, the digital coupon information may allow the terminals to access premium program services at a reduced charge, or at no charge, or allow the terminals to access other information, such as a software program, a computer game, a book in electronic form, a musical composition, an on-screen television program guide, movie or restaurant reviews, or other promotional, informational or educational material. For example, the digital coupon information may allow a terminal to access a premium movie channel for two days with each PPV purchase, or to download one computer video game, or to gain one hour of free connect time to a computer database.

The term "program service" is thus used herein to encompass television, multimedia, and other audio and/or video signals as well as computer software or virtually any other information that can be accessed by, and/or communicated to, the terminals via the channel 120. The term "credit" is used herein to indicate that the terminals are provided with a benefit such as a reduced or waived charge when accessing and/or obtaining program services via the channel, or for obtaining merchandise via the channel which is delivered to the subscriber by other means (e.g., by mail).

The terminals 160, . . ., 170 do not realize the credit which is offered with the digital coupon information until the terminals satisfy certain preconditions. Each terminal includes means for monitoring various factors which define the terminal's usage pattern data over a defined time period, including, for example, the number of PPV programs purchased, the amount of PPV charges incurred, whether, and for what duration, the terminal has been tuned to a particular program or program service, whether the terminal has recently upgraded to one or more premium program services, and whether a promotional period is in effect. The promotional period may apply to individual terminals, such as those of new subscribers, to selected groups of terminals, or to all terminals.

Accordingly, monitoring means in the terminals monitor the above factors to determine whether the usage pattern of the terminal corresponds with the preconditions of the digital coupon information. Optionally, in a "report-back" function, the usage pattern data is periodically transmitted from the terminals to the usage pattern data accounting function 125, for example, via the hub 124 and channel 120, or, alternatively, via a telephone network. For example, the usage data may be transmitted daily, weekly, or monthly.

Such usage pattern data provides valuable information for program service providers and advertisers which can be used to better target individual subscribers and groups of subscribers with products and services with which they are likely to be interested. Moreover, the usage pattern data allows the interested parties (e.g., promoters and advertisers) to determine the effectiveness of various promotions. For example, when the digital coupon information provides a one-half price PPV program to subscribers who infrequently order PPV, the success rate of the program can be determined from the usage pattern data at the function 125.

As another example, when the digital coupon information provides two free days of access to one of a number of available premium program services, the selected premium program service can be monitored, and the subscriber can be subsequently offered a digital coupon which allows him to upgrade to the selected premium program service, e.g., at one-half off the normal charge for the first month. Various other marketing strategies may be used with the present invention to enhance revenue and customer goodwill. For example, a subscriber may be given coupon credit for a free pay-per view movie on his birthday.

Moreover, the digital coupon balance may be adjusted according to lotteries or other contests or games. For example, subscribers may be able to enter a lottery for additional coupons if they spend a certain amount of money. Or, the subscriber may play interactive games of chance where the prizes and losses are determined in terms of coupons.

However, even if the usage pattern data is not reported back to the function 125, the monitoring means in the terminal can determine whether the usage pattern data meets the preconditions of the digital coupon information. Preferably, this is done in a secure manner to prevent tampering by pirates, as discussed in further detail below.

The controller 130 causes the digital coupon information from function 135 to be encrypted and multiplexed at the encryptor/mux/modulator 150 along with the program service data from function 140 and the control data from function 145. The program service data may comprise video and/or audio data which is stored locally on storage media, and/or which is received from an external source such as a satellite downlink. Alternatively, the program service data may comprise computer software or other electronic information.

The control data includes cryptographic data which is used for generating working keys at the terminals for decoding the received data. Typically, one or more premium program services are communicated with basic program services over the channel 120. Both the basic and premium program services may be accessed with possession of the appro-

information, and the coupon credit balance gets incremented by one.

Alternatively, the coupon credit balance is incremented by one with each PPV purchase. When the terminal tunes in to the sixth program, the terminal receives a Entitlement Control Message (ECM) for the program. The terminal uses the ECM to determine the different ways that the program may be accessed. The ECM will also describe the currency cost and the coupon cost, if the program is available by coupon. The terminal will automatically determine whether or not the terminal has a coupon or coupons to acquire the program. If so, the program is automatically offered to the viewer, or the viewer is prompted to purchase the program using currency or coupons.

By choosing the coupon option, the next order for a PPV program is provided free, and the coupon credit field is decremented appropriately. Thus, the balance remains at $15. Alternatively, the terminal is charged for the sixth program, but the secure processor increments the credit balance by the cost, so there is no net change in the credit balance. The secure processor may provide a display on the user interface 226 that informs the viewer that the preconditions of the digital coupon information have been met. Of course, it is possible for coupon credits to accumulate when the corresponding preconditions are met but the credits are not realized, i.e., cashed in. The credits may be retained in the terminal for a predetermined period such as two or three months, or indefinitely. The secure processor may inform the subscriber if the credits are about to expire.

As described in further detail below in connection with FIGURES 4-6, the viewer may query the user interface 226 to determine the credit balance along with other related information.

FIGURE 3 is a block diagram illustrating a decryption hierarchy for use in accordance with the present invention. An encrypted program pre-key is input via terminal 340 to a decryption function 344 which also receives a monthly group key via terminal 342. The program pre-key is unique to each encrypted program offering (e.g., television program) that is available for decryption. The group key is changed on a periodic basis, e.g., once each month. The decryption function 344 decrypts the encrypted program pre-key to provide a program pre-key that is used as one input to a one-way function 348. The other input to one way function 348 comprises various program and coupon attributes, including access requirements, such as coupon and currency cost, for the corresponding program. The access requirements must be met to obtain authorization to view the program. The program and coupon attributes are input via terminal 346, and the one way function processes the program pre-key and program attributes to provide a program key.

The program key output from one way function 348 is used as one input to another one way function 352 that also receives, via terminal 350, an initialization vector (IV) representative of time. The processing of the initialization vector and program key by one way function 352 generates the working keys required by decryption processor 212 of FIGURE 2 to decrypt the program service selected by an authorized user. A further description of the generation of the various keys, including working keys (provided in a "keystream"), can be found in the aforementioned Bennett, et al. patent.

Optionally, the digital coupon information and program services can be encrypted according to a common cryptographic key. This could allow an authenticated file, for example, which represents a coupon image, to be sent to the decoders. The coupon could subsequently be redeemed as an authenticated image by transmitting the coupon from the decoder to the program service provider or other accounting center.

FIGURE 4 is an on-screen display for a user interface in accordance with the present invention. The display 400 may be invoked as pad of a graphical user interface (GUI) which allows a user to select channels and control other features such as volume and the like. Such interfaces are well known in the art. The display 400 may be controlled by a hand-held remote control, a pointing device, voice command or any other available means. For example, a user may select a PPV program such as a movie from a graphical user interface which causes the display 400 to appear.

The display 400 includes a field 410 which informs the user that he is not currently subscribed to the selected program. That is, the user must order the program. A field 420 informs the user that he has different options in ordering the program. Fields 430-460 present the options. A field 440 presents a first option wherein the movie may be purchased as an impulse pay-per-view (IPPV) program with the cost being deducted from an available cash credit balance. The user is thus informed of the cash cost of the movie and the available cash credit balance. The program can be purchased as long as there is a sufficient cash credit balance.

A field 450 presents a second option, where the program may be purchased using digital coupons alone. The user is informed of the coupon cost of the movie and the available coupon credit balance. The program can be purchased as long as there is a sufficient coupon credit balance. The digital coupons are referred to here as "TV" coupons.

A field 460 presents a third option, where the program may be purchased using a combination of cash and digital coupons. The user is informed of the cost of the movie using both coupons and cash, and the available cash credit balance and coupon credit balance. While only one cash/coupon combination is provided in field 460, it will be understood that other combinations may also be provided. In fact, the coupons may be assigned a cash value for this purpose.

In another option, not shown, a subscriber may order a PPV program for a discount if the subscriber is willing to have commercial messages appear which would not otherwise be present. For example, a commercial message using teletext may appear on the bottom portion of the screen when viewing a PPV movie. Or, with VOD, the PPV movie chosen may have periodic commercial message breaks when the discounted program is selected, whereas no commercials would be provided otherwise.

also have the capability of accessing the coupon redemption menu at any time via the remote control.

At block 780, the digital coupon balance is adjusted by the number of coupons redeemed at block 770, and the monitoring of the terminal usage pattern continues at block 720.

Note that it is possible to verify that the user is actually viewing a particular program by requiring some sort of subscriber involvement. For example, to verify that a subscriber has watched an infomercial for Z minutes, the terminal may require the subscriber to input a command to the user interface. The user interface may provide a message such as "Do you wish to continue", to which the subscriber must respond to meet the digital coupon preconditions. An internal timer within the terminal may be halted until a response is received.

For subscribers who view infomercials and the like, to ensure that only one set of coupons are awarded per program, the COUPON_RECORD_DURATION field as discussed below in Table 3 is provided to indicate a duration in which the program record of the infomercial is stored in the terminal. This precludes the same subscriber from getting repeated coupons for the same infomercial that is run again and again, while still enabling the same program ID for the infomercial to be used repeatedly.

The data delivery syntax set forth below in Tables 1-4 may be used in accordance with the present invention. Tables 1-3, respectively, describe data fields which may be used when digital coupons are delivered to terminals using an EMM, an IPPV ECM purchase linkage, and a program re-key ECM. Table 4 describes data fields which may be used with all delivery methods. It should be appreciated that the syntax shown is for illustration only and that other data delivery schemes may be substituted.

TABLE 1

Syntax	Size	Description
COUPON_PROVIDER_ID	3 bytes	Identifies coupon sponsor
NEW_COUPON_CREDIT	3 bytes	Absolute number of coupons for service provider in a month
NEW_COUPON_DEBIT	3 bytes	Absolute debit for service provider in a month
COUPON_CREDIT	3 bytes	Total accrued coupons
COUPON_SEQ_NUMBER	1 byte	Epoch (time period) of coupon delivery

TABLE 2

Syntax	Size	Description
COUPON_PROVIDER_ID	3 bytes	Identifies coupon sponsor
COUPON_CREDIT	1 byte	Coupon credit remaining

TABLE 3

Syntax	Size	Description
COUPON_ID	2 bytes	COUPON_ID + COUPON_PROVIDER_ID = unique coupon ID)
COUPON_PAYOUT_DURATION	2 bytes	Time period subscriber must view program to obtain coupon credit.
COUPON_RECORD_DURATION	3 bytes	Time period coupon is retained at terminal
COUPON_PROVIDER_ID	3 bytes	Identifies coupon sponsor

Moreover, using the COUPON_CREDIT and VH_LIMIT data fields, individual service providers can send digital coupons to individual subscribers. Each service provider is identified by the field VIDEO_PROVIDER_ID. If a pirate were to synthesize a group key message with a false VIDEO_PROVIDER_ID and COUPON_CREDIT, thereby resulting in a bad group key, the pirate might be able to create false VIDEO_PROVIDER_ID, COUPON_CREDIT pairs inside the terminal.

One solution to the above problem is implemented using EMM authentication. In particular, if the group re-key EMM used by a transmitting satellite, for example, is hashed. The hash is then encrypted to create a signature. A pirate cannot produce a counterfeit group re-key EMM without knowledge of a terminal's unit keys, and the key hierarchy. In this case, the counterfeit message will be rejected without processing. Another way to authenticate a message is to use public key cryptography to sign or encrypt the entire message. This can also prevent the generation of counterfeit messages.

Furthermore, a pirate may use "replay" attacks using legitimately built messages. In this case, a legitimate message is saved and provided to a terminal months after the message was originally created and first used to make new COUPON_CREDIT inside the terminal. To protect against this, group sequence numbers may be incremented.

Moreover, the pirate may attempt to replay the message in the same month that it was generated. To protect against this, new COUPON_CREDIT could be tracked during a particular month. At the end of the month, it can be added to COUPON_CREDIT that was earned in previous months. When the COUPON_CREDIT FIELD is sent to the terminal during the month in the group re-key EMM, it would be the absolute coupon credit issued to a particular terminal. Moreover, an additional field, COUPON_DEBIT, may be created inside the terminal to manage the coupons from a particular service provider for that month. Another way to secure against replay attacks within the same month would be to sequence the EMMs themselves. The decoder may then be able to differentiate between a new message and one that it has seen before. Another method would be to include a date/time parameter in the EMM. As with a sequence number, this field can only go forward or stay the same, but cannot be changed to a past value.

For each individual service provider, any new COUPON_CREDIT value must be authenticated, e.g., in the group re-key message just as with the COUPON_CREDIT and VH_LIMIT fields since merely signing the message or using public key cryptography will not prevent such replay attacks. Moreover, each new coupon record should track the sequence number which indicates when it was generated. When the group key epoch occurs, the group re-key EMM that was originally used to create the coupon record will not be able to create additional coupons since the message will be old. At that time, the new COUPON_CREDIT can be added to old COUPON_CREDIT. If, during the next month, no new coupons are sent to the terminal, and all of the existing coupons are used, then the entire coupon record can be erased.

In a second digital coupon delivery method, coupons are delivered through an IPPV buy linkage. With each IPPV purchase, a bit in the program re-key message allows a service provider to deliver one or more coupons automatically and instantly to subscribers without waiting to get a report back or performing a "trip" (e.g., delivery) with coupons as in the group re-key method discussed above. If a subscriber did not have any coupons from a particular service provider before, a new service provider coupon record is made. The coupon creation process is therefore tightly linked to actual purchases of IPPV programs. After a number of coupons have been accrued, the subscriber can redeem them. Typically, a service provider will offer digital coupons which can be redeemed only for that service provider's programs. However, groups of service providers may collaborate to provide interchangeable coupons if desired.

In another possible pirate attack, a pirate may attempt to manipulate the number of coupons which are awarded when performing the digital coupon preconditions, e.g., such as purchasing a number of IPPV programs. One possible solution uses a DES hash with encryption (e.g., signature) or public key encryption of the program re-key message. If the number of coupons is authenticated in the IPPV report-back, then the pirate's manipulation of this field would cause a bad cryptographic field.

If the pirate does know the group key, counterfeiting could occur but may be detectable if the view history information (e.g., usage pattern data) is used to hash the coupon value and is sent along in the report-back.

Moreover, if public key cryptography was used in the delivery of the program re-key message, then, even if the pirate knew the group public key, a message still could not be synthesized since the group private key would not be known. Public key cryptography has a distinct advantage over secret key cryptography since the group encrypt or private key is not in the terminal. Consequently, VLSI probing and other attacks against the terminal cannot reveal the key.

In a third delivery method in accordance with the present invention, digital coupons are delivered in conjunction with extended commercial programs known as "infomercials." Preferably, a subscriber is rewarded with digital coupon credits only after viewing the program for a specific amount of time. Furthermore, to prevent the subscriber from simply tuning in the program and walking away, it might be advantageous to require some sort of subscriber involvement such as a control input which is requested by the user interface.

A pirate may be able to alter code in a non-secure processor to automatically provide the subscriber involvement control signal. However, the amount of time that the program must be viewed, or at least tuned in, can be secured. To do this, there is no need to track the maximum time that the program lasts since the infomercial service provider is

Claims

1. A communication system, comprising:

   a controller for transmitting program services to a plurality of subscriber terminals via a communication channel;
   said program services being adapted to be selectively recovered by said subscriber terminals;
   said controller being adapted to deliver digital coupon information to said terminals via said communication channel;
   said digital coupon information allowing said terminals to obtain credits when recovering first particular ones of said program services according to preconditions of said digital coupon information;
   said terminals maintaining a running balance of said credits obtained.

2. The system of claim 1, wherein:

   said credits are usable in obtaining second particular ones of said program services at a reduced charge.

3. The system of claim 1 or 2, further comprising:

   monitoring means for monitoring a usage pattern of a selected one of said terminals to determine if said preconditions of said digital coupon information have been satisfied;
   said usage pattern being indicative of at least one of:
   (a) which of at least one of said first particular program services have been recovered by said selected terminal, and
   (b) a duration during which at least one of said first particular program services have been recovered by said selected terminal;
   wherein said credits are provided when there is a correlation between said usage pattern and said preconditions of said digital coupon information.

4. The system of one of the preceding claims, further comprising:

   a user interface for selectively redeeming said credits according to a user input.

5. The system of one of the preceding claims, further comprising:

   a user interface for obtaining a confirmation of user involvement when a corresponding one of said terminals is recovering said first particular ones of said program services.

6. The system of claim 3, wherein:

   said first particular ones of said program services provide a plurality of individual programs which are adapted to be individually recovered by said selected terminal; and
   said credits are provided when said usage pattern indicates that said selected terminal has recovered at least one of:
   (a) a predetermined number of said plurality of individual programs; and
   (b) a predetermined amount of charges which are incurred by said selected terminal in recovering at least one of said individual programs.

7. The system of one of the preceding claims, further comprising:

   means operatively associated with said controller for encrypting said digital coupon information and said program services according to a common cryptographic key.

8. The system of claim 3, further comprising:

   a usage pattern accounting center which is operatively associated with said controller;
   said usage pattern accounting center being adapted to receive information indicative of said usage pattern of said selected terminal from said monitoring means via a communication link;

17. The terminal of one of claims 10 to 16, wherein:

said digital coupon information and said program services are encrypted according to a common cryptographic key.

18. The terminal of one of claims 10 to 17, further comprising:

authentication means for cryptographically authenticating said digital coupon information.

19. The terminal of claim 18, wherein:

said authentication means authenticates said digital coupon information according to a group key.

20. The terminal of claim 18 or 19, wherein:

said authentication means authenticates said digital coupon information according to a public key.

21. The terminal of one of claims 10 to 20, wherein:

said program services include programs which are encrypted according to associated program re-keys; and
at least a particular one of said program re-keys is communicated to said terminal to allow said terminal to decrypt and recover the associated program using said program re-key; and
said digital coupon information is communicated to said terminal with said program re-keys.

22. A method for transmitting digital coupon information from a controller to a plurality of subscriber terminals in a communication network via a communication channel, said network also being used for communicating program services from said controller to said plurality of subscriber terminals, said program services being adapted to be selectively recovered by said subscriber terminals, comprising the steps of:

targeting at least selected ones of said terminals to receive said digital coupon information;

delivering said digital coupon information to said terminals via said communication channel;

said digital coupon information allowing said terminals to obtain credits when recovering first particular ones of said program services according to preconditions of said digital coupon information; and
maintaining a running balance of said credits obtained at said terminals.

23. The method of claim 22, wherein:

said credits are usable in obtaining second particular ones of said program services at a reduced charge.

24. The method of claim 22 or 23, comprising the further step of:

monitoring a usage pattern of a selected one of said terminals to determine if said preconditions of said digital coupon information have been satisfied;
said usage pattern being indicative of at least one of:
(a) which of at least one of said first particular program services have been recovered by said selected terminal, and
(b) a duration during which at least one of said first particular program services have been recovered by said selected terminal; and
providing said credits when there is a correlation between said usage pattern and said preconditions of said digital coupon information.

25. The method of claim 24, wherein said first particular ones of said program services provide a plurality of individual programs which are adapted to be individually recovered by said selected terminal, said method comprising the further step of:

providing said credits when said usage pattern indicates that said selected terminal has recovered at least one

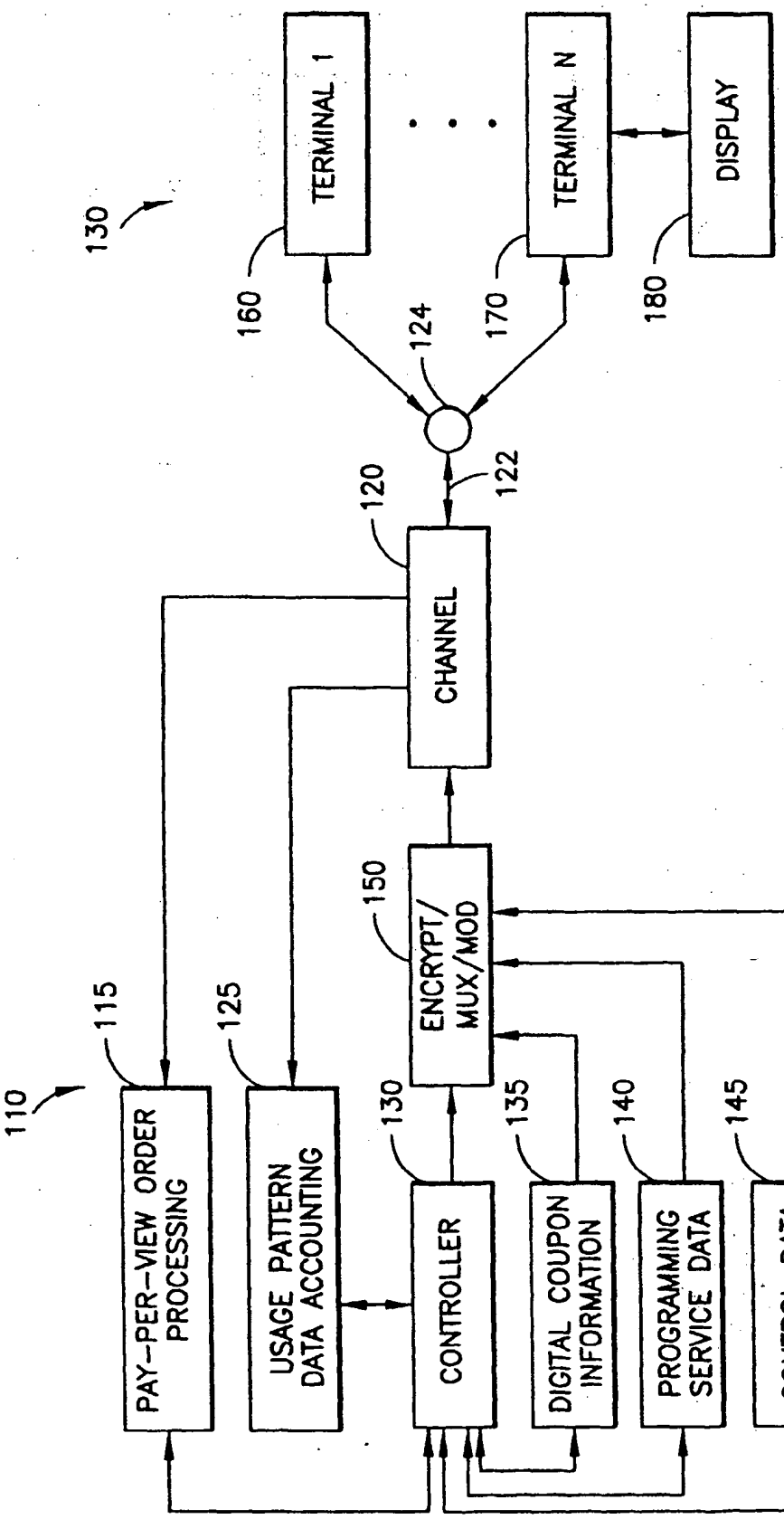
110
115
125
130
135
140
145
150
120
122
124
160
170
180
130
PAY-PER-VIEW ORDER PROCESSING
USAGE PATTERN DATA ACCOUNTING
CONTROLLER
DIGITAL COUPON INFORMATION
PROGRAMMING SERVICE DATA
CONTROL DATA
ENCRYPT/ MUX/MOD
CHANNEL
TERMINAL 1
TERMINAL N
DISPLAY

FIG.1

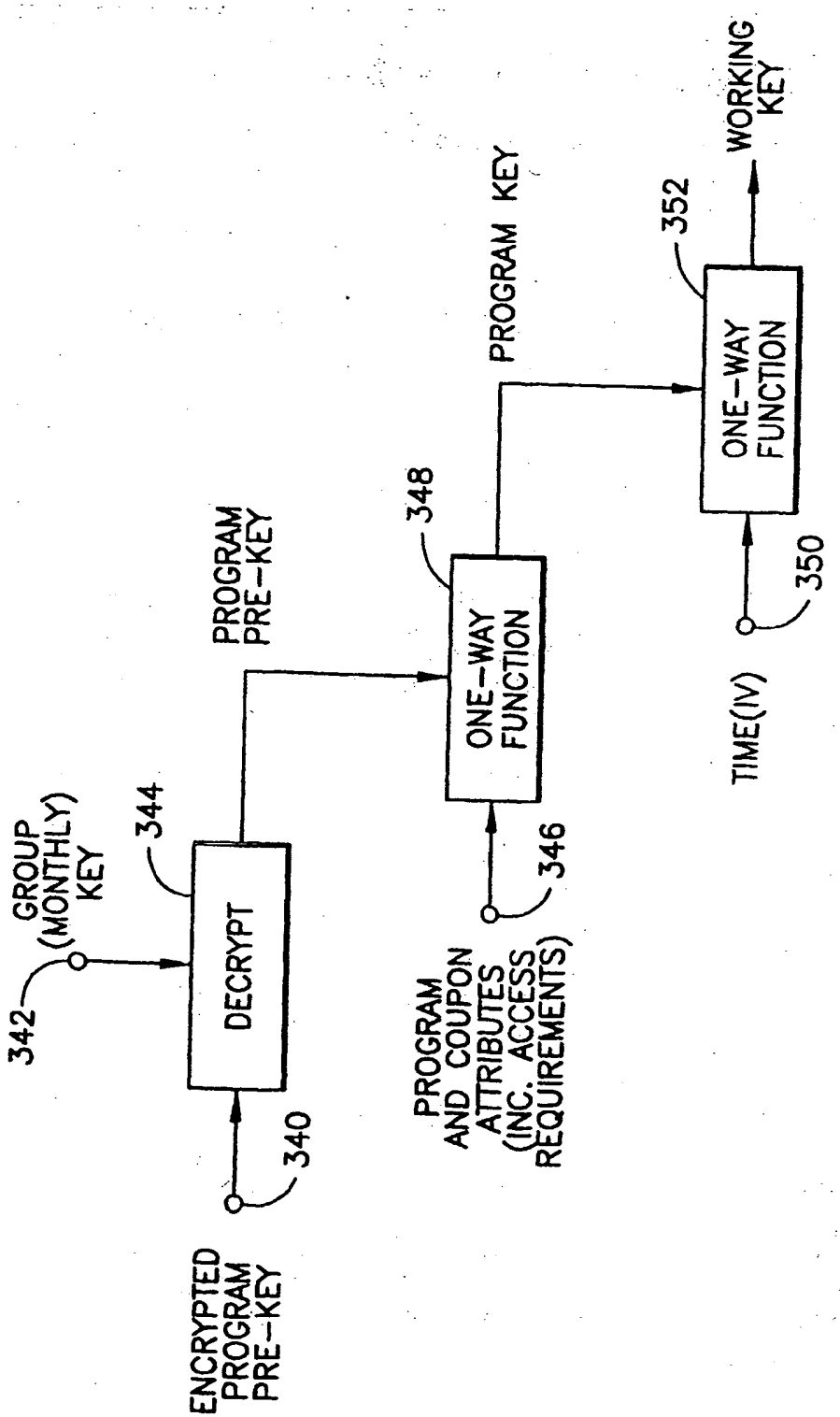
ENCRYPTED PROGRAM PRE-KEY
340
DECRYPT
342
GROUP (MONTHLY) KEY
344
PROGRAM PRE-KEY
PROGRAM AND COUPON ATTRIBUTES (INC. ACCESS REQUIREMENTS)
346
ONE-WAY FUNCTION
348
PROGRAM KEY
TIME(IV)
350
ONE-WAY FUNCTION
352
WORKING KEY

FIG.3

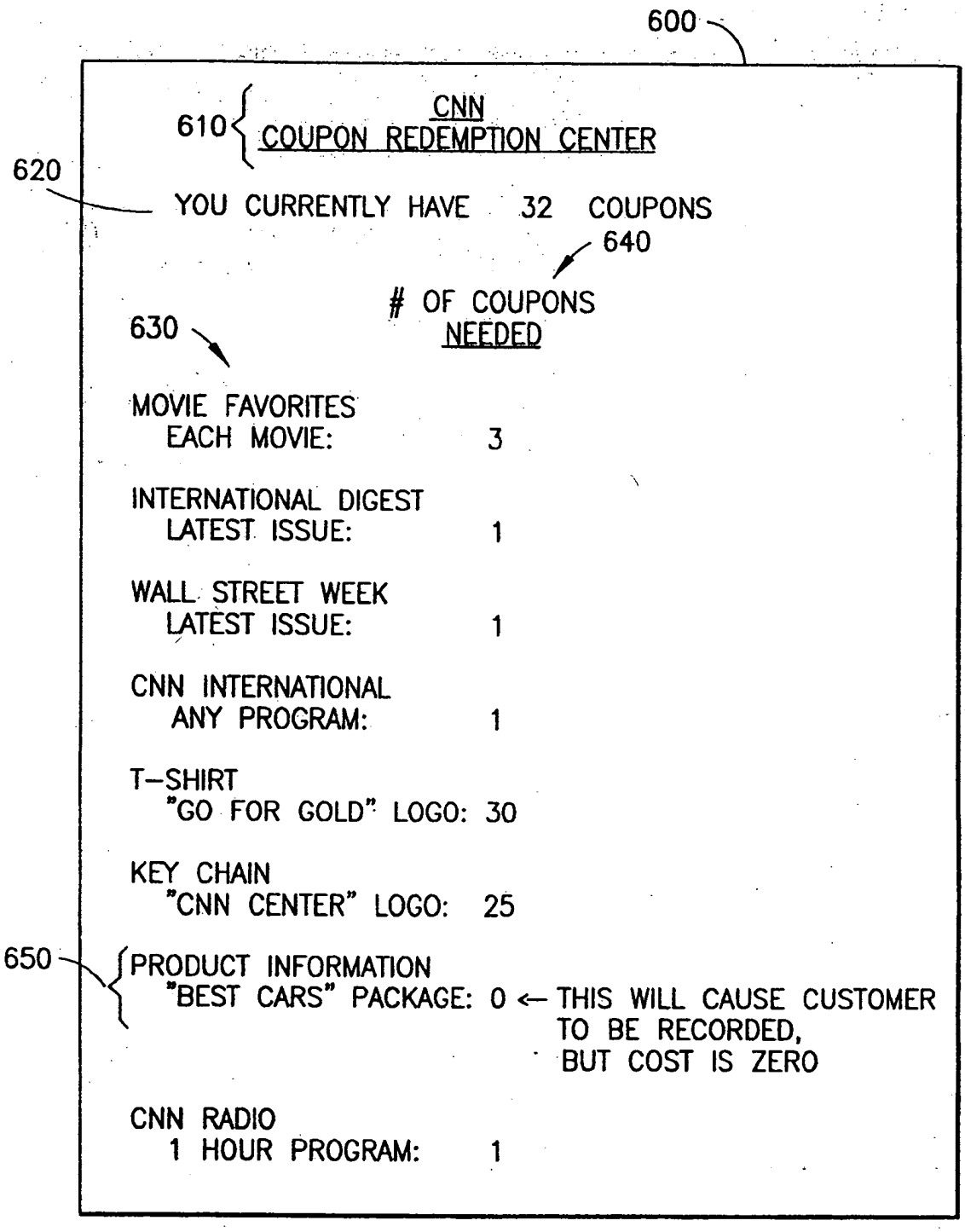
600
610
CNN
COUPON REDEMPTION CENTER
620
YOU CURRENTLY HAVE 32 COUPONS
640
OF COUPONS NEEDED
630
MOVIE FAVORITES
EACH MOVIE: 3
INTERNATIONAL DIGEST
LATEST ISSUE: 1
WALL STREET WEEK
LATEST ISSUE: 1
CNN INTERNATIONAL
ANY PROGRAM: 1
T-SHIRT
"GO FOR GOLD" LOGO: 30
KEY CHAIN
"CNN CENTER" LOGO: 25
650
PRODUCT INFORMATION
"BEST CARS" PACKAGE: 0 ← THIS WILL CAUSE CUSTOMER TO BE RECORDED, BUT COST IS ZERO
CNN RADIO
1 HOUR PROGRAM: 1

FIG.6

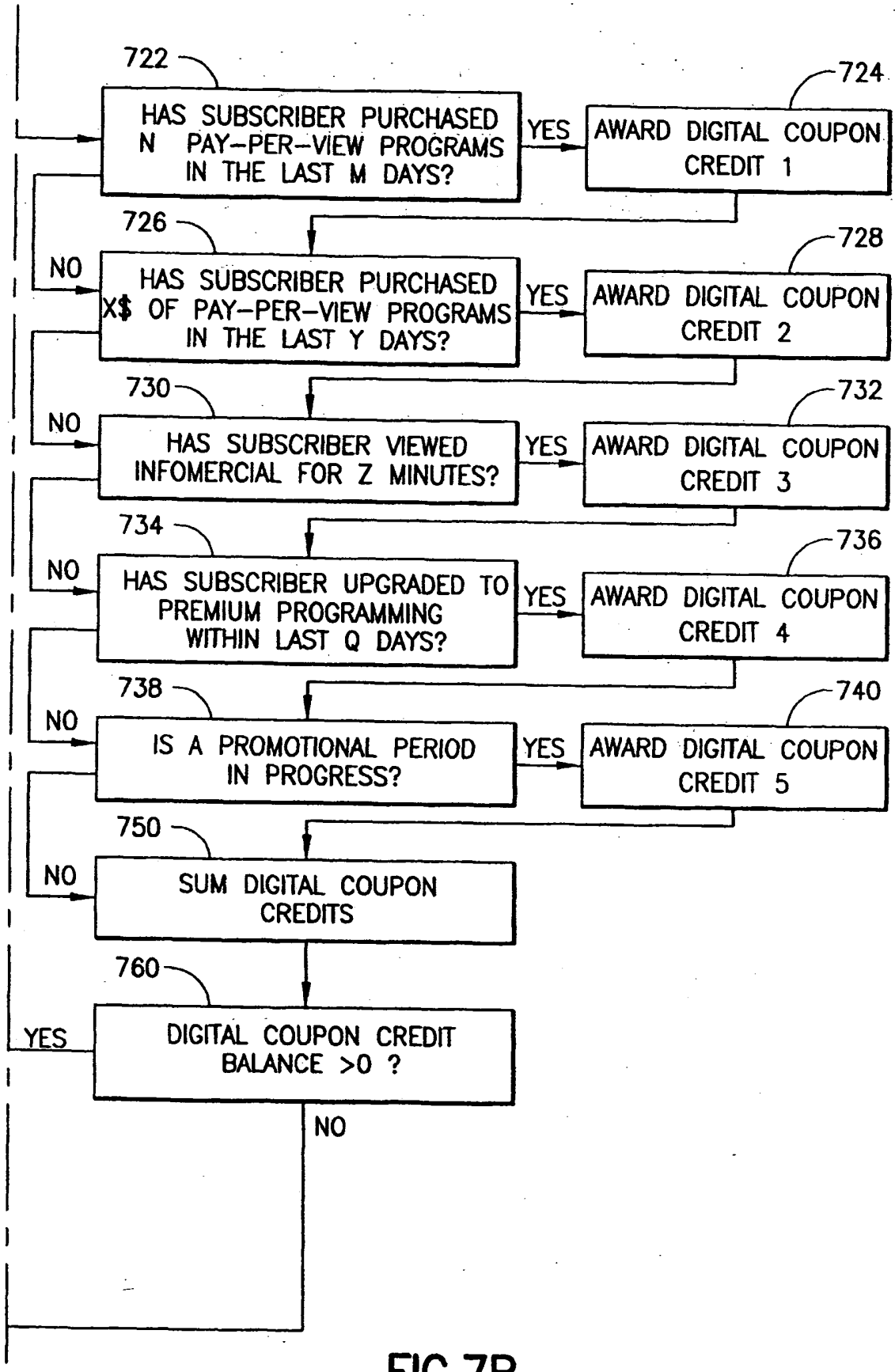
722
HAS SUBSCRIBER PURCHASED N PAY-PER-VIEW PROGRAMS IN THE LAST M DAYS?
YES
724
AWARD DIGITAL COUPON CREDIT 1
NO
726
HAS SUBSCRIBER PURCHASED X$ OF PAY-PER-VIEW PROGRAMS IN THE LAST Y DAYS?
YES
728
AWARD DIGITAL COUPON CREDIT 2
NO
730
HAS SUBSCRIBER VIEWED INFOMERCIAL FOR Z MINUTES?
YES
732
AWARD DIGITAL COUPON CREDIT 3
NO
734
HAS SUBSCRIBER UPGRADED TO PREMIUM PROGRAMMING WITHIN LAST Q DAYS?
YES
736
AWARD DIGITAL COUPON CREDIT 4
NO
738
IS A PROMOTIONAL PERIOD IN PROGRESS?
YES
740
AWARD DIGITAL COUPON CREDIT 5
NO
750
SUM DIGITAL COUPON CREDITS
760
DIGITAL COUPON CREDIT BALANCE >0 ?
YES
NO

FIG.7B

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(54) Digital coupons for pay television

(57) Digital coupons are selectively transmitted in a communication network to subscriber terminals for promotional purposes. Subscribers automatically receive coupon credits when they meet the preconditions of the digital coupons. Free or reduced price pay-per-view (PPV) programming in particular may be provided when a subscriber purchases a given number of PPV programs at a regular price. The terminals maintain a running balance of available coupon credits and inform the subscriber via a user interface of the available balance. Subscribers can be rewarded for viewing commercial messages by awarding coupons which can be immediately redeemed for PPV programs. With an optional report back capability, terminal usage pattern data can be retrieved and analyzed by program service providers to determine the effectiveness of the promotions and to gather additional demographic and individual data. The integrity of the scheme is assured with encryption techniques.

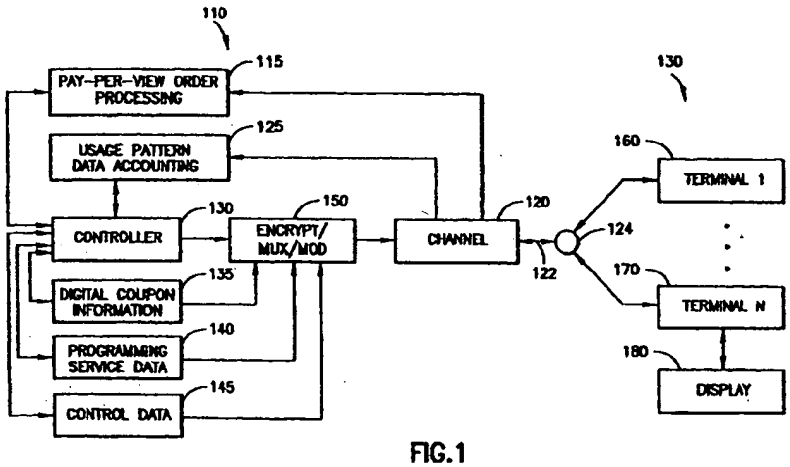

FIG.1

EP 0 891 084 A3

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 98 11 1861

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02-09-1999

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